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BENEATH DESCENT, A GENERATOR, NOT A TONGUE
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Unlettered Regenerative Floor

The articulatory-auditory floor beneath descent and an infra-Nostratic account of convergence across Semitic and Indo-European Languages

Mohammad F. Islam, PhD[1]

[1] Independent Researcher, USA. Correspondence: islamm@alumni.iu.edu. Master reference for the method: Islam (2026), Zenodo DOI 10.5281/zenodo.20757507.

Beneath every language family the comparative method can reach there is no older language to reconstruct; there is a floor, and the floor is never inherited. The paper states it in four faces, each a measured object: production, the finite lattice of stable vocal-tract closures and the corners of the vowel space; reception, the category boundaries the ear imposes before any lexicon exists, in one-month infants and in chinchillas; regeneration, the rebuilding of both in every infant, which is why nursery forms escape sound law; and channel, the vocal-auditory pair as the one channel whose receiving organ has an emitting twin. It then reads the floor inward as one triad seated at seven rungs: the first cut of a claim into three slots, the thermodynamics of phonation, the source-filter tube and the cochlea as Fourier duals, the maps in nerve, the sensorimotor loop that learns by prediction, the arch-derived anatomy of larynx and ear, and the vocal-hearing complex, the physics cited at theorem grade and the neural rungs held open. The production rung is executed on the world's inventories: constriction, resonance, and phonation vary independently across 3,020 inventories, 0.92 of the maximal volume, and almost perfectly once descent is projected out, 0.99, while family means alone couple at 0.68; descent couples the generators and regeneration decouples them. Twelve paired exhibits set Quranic Arabic beside the Indo-European superfamily as convergence and never as cognates; a dated roster of scripts and scriptures places the mouth before the pen; the three-consonant Semitic root is audited on 1,651 Quranic roots and typed as a code of least sufficient length; the speech loop is read as a damped self-witnessing recurrence with a 200 ms carrier found in three literatures. Three forced falsification criteria are stated and two have been run. The discussion closes on a table stating the paper's relation to twenty-two prior positions in words defined once: one replaced, the blank slate; three contradicted on executed data, substance-free phonology, arbitrariness as foundation, and the ancillarity of externalization; one competed with; four subsumed; three added to on data; four corroborated with no warrant claimed; three scoped; two kin held open; none superseded, since the floor says nothing about the clause. The claim is structural, rests on cited results and two public databases at stated digests, and its contribution is exactly that set of relations.

KEYWORDS sound symbolism · iconicity · categorical perception · Nostratic · writing systems · acrophony · Semitic root · Quranic Arabic · Indo-European · phonemic awareness

1 Introduction

The problem has two halves that the literature holds apart. On one side, unrelated languages very often use the same sounds for the same basic referents: words for tongue tend to carry *l* or *u*, words for nose *n*, words for round and red *r*, words for small *i*, across nearly two-thirds of the world's languages and across continents and lineages, and the areal and historical distribution of these associations shows them often emerging independently rather than being inherited or borrowed[1]. On the other side, the comparative method, the only instrument that establishes descent, loses its signal at a depth of roughly eight to ten thousand years, beyond which regular correspondence cannot be told from chance[2,3]. The macro-family proposals that would join Indo-European and Afroasiatic under one ancestor, Nostratic among them[4,5], sit past that depth, and the dispute over them has become a dispute about consensus rather than about evidence.

This paper proposes that the two halves are one fact seen from two sides. The regularities recur because there is something beneath every family that no family inherits, and the method cannot reach it because it is not a language at all. It is a floor: the finite set of stable closures the vocal tract affords, the corners of the acoustic vowel space, and the category boundaries the mammalian ear imposes on what leaves the mouth. Each infant rebuilds the floor from tube and ear, so it is present now in every speaker, presupposed by every reconstruction, and a premise in none. The prefix the title carries is chosen against the older one. *Pre*-Nostratic would place the floor before Nostratic in time. The floor is beneath every proto-language in kind, and *infra*-Nostratic names that. *Unlettered* names the stratum: prior to letter, spelling, and alphabet.

Four consequences are argued. First, the floor explains convergence without descent, and predicts where convergence must stop. Second, every script that ever became phonetic did so by reading a picture for its sound, and every such event records a cut the ear had already made; the script is downstream, a receipt, and the oldest scripts and scriptures attest the order by placing the mouth before the pen. Third, the most famous count in Semitic, the three-consonant root, is not a signature of the floor and must not be read as one: it is a family-bound code whose length is the least sufficient under a combinatorial constraint, which the paper executes. Fourth, the floor is not one object with four faces but one triad seated at seven grains, and at its physical grain, the three generators of speech, it is independent in fact, which the paper executes on the world's inventories with and without descent projected out.

The paper is organized as follows. Section 2 states the floor's four faces, then reads the floor inward as a ladder of seven rungs and outward as a loop. Section 3 gives the forcing in four steps. Section 4 sets Quranic Arabic beside the Indo-European superfamily in twelve paired exhibits. Section 5 reads the oldest scripts and scriptures as attesting texts. Section 6 audits the Semitic root. Section 7 states three forced falsification criteria. Section 8 discusses what the paper adds to the literature and what it does not, and closes on a table of the paper's relation to each prior position; Section 9 concludes. Every warrant is typed. Nothing here is theorem-grade beyond the anatomy, the arithmetic, and the settled decipherments; the claim as a whole is structural, and it rests on the cited results alone.

2 The floor

2.1 Four faces

Four faces, each a physical object. The floor is not a proposal about meaning. It is a description of two organs and what passes between them, and each of its faces is measured.

Production. The vocal tract is a tube of bounded length with a small set of movable constrictors, and its acoustic output is a non-linear function of constrictor position: there are plateaus where a large articulatory movement changes the output little, separated by narrow regions where a small movement changes it abruptly. Languages seat their consonant places on the plateaus, which is why the inventory of places is finite and recurrent, lips, teeth, ridge, palate, velum, uvula, pharynx, glottis, and why no language has a place the anatomy does not afford. This is the quantal theory[6,7], corroboration-grade on the model and theorem-grade on the anatomical finitude. The vowel face is the same fact read on the open tube. The first two resonances span a bounded two-dimensional region, and the maximally dispersed three-point system sits at its corners, the *a i u* triangle, the most common minimal vowel system on earth, under the dispersion theory[8], with the later self-organization simulations deriving such systems from tract and ear alone[9,10].

Reception. The mammalian ear does not hear the voicing continuum continuously. The voice-onset-time continuum from a voiced to a voiceless stop is heard categorically, with a boundary that adult listeners cannot hear across[11]. One-month-old infants discriminate at the same boundary before any lexicon exists[12]. Chinchillas trained on the alveolar voiced-voiceless pair place their boundary where human listeners place theirs[13], and macaques show the same enhanced discriminability at the phonetic boundary[14]. The boundary is a property of the auditory system meeting the acoustics, not of any language. The ear also reads the mouth directly: a seen *ga* with a heard *ba* is perceived as *da*[15], so reception is already oro-aural and never purely acoustic.

Regeneration. Nothing in the two faces above is transmitted. Each infant arrives with the tube and the ear and rebuilds the lattice from them. This is why the nursery stratum shows no drift: *mama* and *papa* recur across unrelated families because the bilabial nasal is the sound of the suckling mouth and the labial stop its release[16,17], not because a proto-language transmitted them. A form regenerated in every generation is a form no sound law governs, and that fact is the paper's first falsifier (Section 7).

Channel. Why the floor lives in sound and not in sight is answered by the design of the channel, and the answer is Hockett's[18]: the vocal-auditory channel is the one whose receiving organ has an emitting twin, interchangeability, so that what the ear takes in the tract can reproduce to a close approximation, at distance, against barriers, without a tool. No organ emits light; touch reaches what it touches; smell and taste emit nothing. Mimicry by the same kind, sound answered by sound, is the minimal communication, and the older claim that song precedes the word belongs here[19,20]. The prediction that follows is a boundary the floor must respect, and does: where a channel acquires an emitting organ, the hands under the eyes, iconicity runs high again, on the visual floor those two organs make, which is the recorded profile of the signed languages[21].

The invariance statement. A phoneme is an orbit under speaker and context variation; the phonetic chart is a chart of the lattice; a letter is a chart of that chart. A fact about signs therefore carries no information about the lattice that a fact about sounds does not already carry, and this paper refuses script as evidence of the floor at every point, admitting it only as a receipt (Section 5).

2.2 The ladder: one triad at seven grains

The four faces are the floor seen from outside. Seen from inside, the floor is one structure repeated at seven registers, and at each register

the same three things stand apart: what stands, what moves, and how the two bind. The physics of the lower rungs is settled and cited at theorem grade; the neural rungs are cited and left open, since nothing on them is executed here.

Rung 0, the first cut. Before any sound, a claim decomposes into three irreducible slots, existence, action, relation, under a deletion test and an isolation test, and no complete claim decomposes into two or four[64]. This is the rung at which language is a cut, and the rungs below it are the physics that gives the cut a voice.

Rung 1, thermodynamics. Speech is work. Phonation is a self-sustained oscillation of the vocal folds driven by subglottal pressure and flow, the myoelastic-aerodynamic account[65,66]; the pressure source in speech is expiratory, rib-cage recoil checked by the diaphragm with the intercostal and abdominal muscles driving[67], the diaphragm's own nerve the inspiratory prime mover; the flow is egressive, one direction, and that direction is carried in the breath before it is carried by any sentence. The listener's categorization discards within-category variance, which is an erasure and is priced[68]. Three axes: the pressure that moves, the fold and tube that stand, the registered category that binds them.

Rung 2, biophysics, the Fourier pair. The source-filter theory states the production face exactly: a glottal source spectrum shaped by the transfer function of a tube, the formants its resonances[69], the quantal plateaus the regions where shape and spectrum are stably paired[6,7]. The reception face is the dual: the basilar membrane is a mechanical frequency analyser and tonotopy is the cochlea's Fourier map[70], so the ear recovers from a spectrum the shape the tract encoded into it. The two organs are transforms of each other, and that is the physical content of interchangeability[18]: one can reproduce what the other receives because each is the other's dual. At this rung the three axes are three physical generators and nothing else, the floor's own sub-generators, three sources inside the one generator of Section 3, constriction, the closure lattice, giving consonants; resonance, the open tube, giving vowels; phonation, the fold, giving voice, pitch, and tone. Section 3 carries their executed independence and Appendix A its receipts.

Rung 3, electrophysiology. Auditory-nerve fibres phase-lock to the waveform and the cochlear map is preserved to cortex; the categorical boundary for stop consonants has a direct correlate in human superior temporal gyrus[71], phonetic features are encoded there as a feature space[72], and the articulators are mapped somatotopically in ventral sensorimotor cortex during speech[73]: the mouth's lattice on the motor side and the ear's categories on the sensory side, each a map. Cited, not executed; the imprint of this rung is open.

Rung 4, neuroscience, regeneration as a circuit. The floor is innate as a lattice and learned as an inventory, and the circuit that does the learning is known in outline: the dorsal stream maps sound to articulation[74], which is interchangeability as anatomy; perceptual narrowing between six and twelve months prunes the universal boundaries to the native inventory[75,76], which is regeneration followed by selection; vocal learning has a comparative circuit literature[77]; and the whole loop is modelled as prediction error minimised by acting[78,79]. Cited, not executed.

Rung 5, neuroanatomy. The language areas sit beside auditory cortex and are wired to it; humans carry a direct corticobulbar projection to the laryngeal motoneurons that other primates lack in that strength[80,81], the prerequisite of voluntary phonation; Broca's area sits upstream of articulation and is silent during the act itself, gating the motor program rather than executing it[82,83]; the middle-ear ossicles and the laryngeal cartilages derive from the pharyngeal arches, the first and second the malleus, incus, and stapes, the fourth and sixth the laryngeal cartilages, so the receiving and emitting organs are kin in development; and congenital deafness impairs speech, the loop failing when one end is cut. Settled anatomy, cited.

Rung 6, the vocal-hearing complex. The four faces of 2.1 are this rung. Delete any rung and the one above loses its physical carrier: no cut, no distinction to price; no work, no oscillation; no duality, no interchangeability; no map, no category; no circuit, no learning; no anatomy, no circuit; no complex, no floor. The ladder is not a chain of causes but the same triad seated at seven grains.

2.3 The loop: a self-witnessing recurrence at two grains

The floor closes on itself. Every speaker hears everything they say, total feedback, the fifth of the design features[18], and the path is a loop: cortical command, expiratory pressure, fold and tongue and lips, the medium, the ear, auditory cortex, and back to the command. The loop is modelled explicitly as a control system, feedforward command, auditory and somatosensory feedback, error maps, correction[84], and it has a gain and a phase, so it has a stability condition of the familiar kind: a self-excited loop howls when its gain exceeds unity at a phase that closes. The brain damps its own return: auditory cortex responds less to self-produced speech because an efference copy of the motor command arrives with the sound[85,86]. Shift the phase and the loop destabilizes: delayed auditory feedback disrupts fluent speech, worst near 200 ms[87], and altered feedback reduces stuttering[88], which reads as a loop whose gain or phase is off.

The loop has a carrier, and the carrier's period is found three times in three literatures that do not cite one another. The syllable, the mandibular oscillation of the frame[89], runs at four to five hertz, about 200 ms; auditory cortex entrains to speech at exactly that rhythm, theta tracking syllables with delta above it for phrases and gamma beneath for phonemes[90,91]; delayed feedback is most destructive near 200 ms; and turn-taking across ten languages from five continents shows a median gap near 200 ms[92], the cross-subject loop closing at the same period as the within-subject one. A count reached three ways witnesses nothing above the count, and the paper claims nothing above it; it is the strongest exhibit that the within-speaker loop and the between-speaker relay are one loop and not an analogy. The relay works because each ear drives a mouth: listening activates the listener's own motor speech areas[93], and a listener's cortex follows the speaker's with a lag that predicts comprehension[94]. Correction runs at both grains under one name: the efference loop repairs at the scale of

milliseconds and conversational repair, self-repair and other-repair, at the scale of seconds[95]. And direction rides the copy, not the sound: auditory cortex's magnitude response is blind to who spoke, and what marks a voice as one's own is the efference copy, a signal from the motor plan arriving beside the sound.

Counts, honest: the loop has three physically distinct stations, neural command, pneumatic-mechanical actuation, acoustic-cochlear registration, the triad again; the within-subject and cross-subject loops are one structure at two grains; the carrier is a 200 ms period found three ways. Grade: structural on the loop and the two-grain reading, E3 on every cited leg. One fence binds: what reverberates here is recurrence, output fed back as input, and not recursion in the syntactic sense, hierarchical embedding; whether the second grew out of the first is a standing hypothesis, the auditory-vocal working-memory loop as the evolutionary core of the language areas[96], and the paper holds it open. The author stated the loop's primacy in an essay of 2014[97] by an argument from sensory constraints, without the vocabulary of the working-memory account[96,109], which reads as independent generation at corroboration grade; the neuroanatomical account is older, Hockett's design features[18] older still, and the two roads converge on one proposition and confer on it no warrant beyond their own.

3 The forcing

Step one, the ceiling. The comparative method reads regular sound correspondence, and its signal decays: beyond roughly eight to ten thousand years the expected number of chance resemblances between two vocabularies is of the order of the expected number of retained cognates, and a correspondence set at that depth cannot be told from noise[2,3]. Nostratic as a descent claim is therefore open, an evidential openness with no theorem behind it, and nothing in this paper moves that verdict in either direction; the field's dismissal and the proponents' acceptance carry equal weight here, which is none.

Step two, the residue. Across basic-vocabulary lists covering nearly two-thirds of the world's languages, a considerable proportion of one hundred items carry associations with specific speech sounds that recur across continents and lineages, the body-part terms strongest, and these associations often emerge independently rather than being inherited or borrowed[1]. The bouba-kiki shape-sound mapping holds across speakers of twenty-five languages from nine families and ten writing systems, and the orthographic shape of the words in the different scripts does not drive it[22]; it holds in the Himba of Namibia, who have no writing system[23]; and it fails where the nonce words are not possible words for the listener's ear[24], which is the boundary any such claim must show before it is more than confirmation accumulated. A second residue lives one register up, at the inventory. Across the 3,020 inventories of the world's phonological database[98] the sizes of the three generators, consonant, vowel, and tone inventories, are nearly independent, the three-row Gram enclosing 0.921 of its maximal volume with pairwise correlations of 0.16 to 0.18, and 0.911 with one inventory per language (Appendix A, Box 4). Project descent out, removing each family's mean from its members across 2,865 inventories in 138 families, and the independence sharpens to 0.993 with correlations of 0.03, 0.01, and 0.07, while the family means alone couple at 0.678. Descent couples the generators; what remains once it is projected out is uncoupled. A transmitted ancestral inventory would carry its three counts together along lineages; a generator rebuilt in each speaker from tube and ear would not; the data read the second way.

Step three, the projection. Three common sources are supplied and each is projected out. Descent, wherever correspondence is regular. Borrowing, wherever a loan trajectory is documented, and borrowing does not reach the somatic core in any case. Script, by the cross-script and script-naive tests just cited. The residue does not vanish under any of the three. What remains correlated with the residue is the one source every family shares and no family inherits, the tract and the ear, and it is measured: anatomy, acoustics, and psychophysics are quantities. Stated as a single identity, with x the vector of cross-family association strengths over the concept set and P_d, P_b, P_s the projections onto the descent, borrowing, and script covariates, the residue is r = x − P_d x − P_b x − P_s x, and the claim is that r is not the zero vector and that its only measured correlate is the shared apparatus; the first half is what the cited studies report and the second half is what no study has proposed a competitor for. A residue surviving the projection of every supplied common source and correlated with a measured generator is what forces a floor. Not a language. A generator.

Step four, the receipt. Every deciphered script that became phonetic did so by a single move, reading a picture for its sound and not for its picture, and every such event records, after the fact, a cut the ear had already made. The law is scoped exactly. The cut it names is the perceptual boundary, the one the infant and the chinchilla already hear. The segmentation of a word into units, the awareness that extracting the first sound of a name performs, is not shown pre-literate here; the position that such awareness derives from alphabetic literacy is widely held[25,26,27] and the illiterate-adult deletion results stand as its evidence[28,29]. On that second cut the script may train what it records, and the paper holds the question open (Section 8). The alternative accounts are exhausted on the first cut: an account beginning at script cannot reach the floor, because every phonetic script already encodes a perceptual boundary that precedes it, and an account beginning at descent cannot reach the floor, because the floor is regenerated and never inherited. The third object is therefore forced.

4 Paired exhibits

The attestation grade of each object is stated once. Quranic Arabic is heard, a living recitation chain with its own articulatory science, and recorded in a consonantal skeleton. Vedic Sanskrit is heard and recorded late. Greek, Latin, and Germanic are recorded. Proto-Indo-European and Proto-Semitic are reconstructed, and every asterisked form is analysed as a reconstruction. Sumerian and Egyptian are recorded with no living ear. Every consonantal script inverts the acoustic priority: it keeps the consonants, the least audible component, and loses the vowels, the most audible, so the two cases in

which the loud part survived are the two in which the mouth carried it, the Quranic and the Vedic recitation chains[30,31].

Every row of Tables 1 and 2 is a convergence and not a cognate. No descent between Semitic and Indo-European is claimed in any row; the floor predicts convergence without descent, and the rows are that prediction met. Iconicity is typed and never scored: onomatopoeic where the referent is a sound, motivated where an articulatory or somatic account is available, and in neither case above conditional grade.

Table 1 | Paired exhibits, one to six, Quranic Arabic against the Indo-European superfamily. Every row a convergence, no row a cognate. Mechanism at the tract and ear; evidence tier E2 where a primary study was read for this paper, E3 where cited from the literature.

Field	Quranic Arabic, heard	Indo-European	Third attesting text, family stated	Mechanism	Type · tier
mother, father	umm (31:14), ab, *ya abati* (12:4)	*meh$_2$ter*, ph$_2$ter; atta in Hittite, Gothic, Greek, Latin	Sumerian ama, ad-da (isolate); Egyptian mwt (Afroasiatic)	bilabial nasal of the suckling mouth, labial stop of its release; regenerated per infant, immune to sound law[16]	motivated · E3
tongue = language	lisan, *bi-lisanin arabiyyin mubin* (26:195; 14:4; 30:22)	lingua, glossa, tunge, yazyk; PIE *dnghweh$_2$s	Sumerian eme (isolate); Akkadian lishanu (Semitic)	the organ names the faculty before any script, in three unrelated lines; the lateral is the tongue-body sound[1]	motivated · E2, E3
nose, breath	anf; nafas, nafs, *nafakhtu* (15:29), *al-naffathat* (113:4)	*nas-, nasus, nose; the sn-phonestheme, snout, sniff, snore*[32]; pneu-, pneuma; *h$_2$enh$_1$-, anima	Egyptian fnd (Afroasiatic); Akkadian napishtu (Semitic)	the nasal is made through the nose; the labial fricative is the puff[1]	motivated · E2
breath out, breath in	*zafirun wa-shahiq* (11:106; 67:7)	gasp, sigh, Latin suspirium	Egyptian taw, breath, wind	z-f-r voiced, labial, trill, egressive; sh-h-q voiceless, glottal, uvular closure, ingressive; the two words are the two directions of breath	onomatopoeic · E3
round, turn, roll	dara; *yukawwiru* (39:5), *kuwwirat* (81:1); falak (36:40)	*kwel-, kyklos, cakra, wheel;* (s)ker-; rota, roll	Sumerian gur, to turn (isolate, E3); Hebrew galgal (Semitic)	the liquid is a sustained oscillation; velar plus liquid in both families, not cognate[1]	motivated · E2
strike, knock, crack	*al-qari'a* (101:1; 69:4), *al-tariq* (86:1), *al-sa'iqa* (2:55)	crack, creak; Greek krazo, kroteo; Latin crepare; Sanskrit krand-	none admitted outside the two families	velar or uvular stop plus trill, abrupt release; the bouba-kiki sharp pole[22,23]	onomatopoeic · E2 on Ćwiek, E3 on Bremner

Table 2 | Paired exhibits, seven to twelve, on the same contract as Table 1.

Field	Quranic Arabic, heard	Indo-European	Third attesting text, family stated	Mechanism	Type · tier
whisper, hiss, shriek	*al-waswas* (114:4), hams (20:108), hasis (21:102), *rihan sarsaran* (69:6; 41:16)	whisper, hiss; Latin susurrus; Greek psithyrizo; Sanskrit shvas-	none admitted outside the two families	the sibilant is turbulent airflow, the referent the sound itself; reduplication mimics repetition	onomatopoeic · E3
swallow, throat, choke	*ya ardu bla'i ma'aki* (11:44), halq, *dha ghussatin* (73:13)	*gwel-*, gwerh$_3$-: gula, gullet, vorare, girati; gorge	Hebrew bala' (Semitic)	the guttural is made where the act occurs	motivated · E3
the guttural stratum	the six throat consonants, hamza h ' h kh gh; al-Khalil's first letter, 'ayn, eye and spring	PIE laryngeals h_1 h_2 h_3, predicted from structure[33] and attested as Hittite h[34]; Greek turned Phoenician hamza, he, het, 'ayin into alpha, epsilon, eta, omicron	Ugaritic 'a 'i 'u, three glottal-vowel signs (Semitic)	the pharyngeal-glottal region the Indo-European ear lost and the Semitic ear kept; the Greek transfer is the script receipting the ear's inventory: consonants the adopting ear could not hear became the vowels the abjad had not written	structural · E3, no cognate claim
the small vowel	*ya bunayya* (11:42; 12:5; 31:13; 37:102), the diminutive infix ay	-ino, -ito, -chen, -kin, -y; Greek -iskos; the mil against mal experiment[35]	Ultan's cross-linguistic survey[36]	the high front vowel carries high second-formant energy and reads small under the frequency code[37]; small with *i* across families[1]	motivated · E2, E3
babble = foreigner	a'jam, a'jami (16:103; 41:44; 26:198) against arabi mubin, the root carrying obscurity and muteness	barbaros, bar-bar; Sanskrit barbara; Slavic nemets, the mute one, for German	Judges 12:6, shibboleth against sibboleth (Semitic)	the ear's verdict on the mouth draws the tribal line; the reduplicated labial mimics babble	structural · E3
the three short vowels	fatha, kasra, damma, *a i u*, written as marks on the consonant body by al-Khalil	Sanskrit short *a i u*, the matra on the consonant body in Brahmi	Quechua, Greenlandic three-vowel systems (unrelated)	the corners of the formant plane under maximal dispersion[8]; closure is the body and opening is the mark, in both scripts	corroboration · E3, count fenced in Section 8

One exhibit no lexicon can supply is a single figure in two corpora. Exodus 4:10 records Moses heavy of mouth and heavy of tongue; the Quran records the same impediment in the same organ, *wa-hlul 'uqdatan min lisani* (20:27), *wa-la yantaliqu lisani* (26:13), and Aaron *afsahu minni lisanan* (28:34). Both corpora locate the impediment in the organ, not in any script, and the Quran's own word for the faculty at 26:13 is nutq, articulation, which the classical tradition already separates from bayan, the making of distinctions[38].

5 Attesting texts

Every deciphered script that became phonetic did so by reading a picture for its sound, and every such event is the ear's perceptual cut overriding the eye after the fact, the segmental act it records being dated to the event itself. Script rows are receipts and never grounds. Scriptural rows are documentary; they attest placement and prove nothing, and the paper draws on them as data, never as authority[30]. Tables 3 and 4 run from the earliest stratum forward.

Table 3 | The oldest scripts and scriptures placing the mouth before the pen, earliest strata. Receipts and attesting texts, dated, each with what it registers. All rows E3 unless marked; none load-bearing.

Stratum · date	Attesting text	What it registers
Uruk proto-cuneiform, c. 3300 BCE	the rebus: the arrow sign *ti* read for the syllable *ti* in life[39]	a picture read for its sound; the ear's cut becomes the sign
Sumerian sign KA	the mouth pictogram carries the readings ka, mouth; inim, word; dug_4, to speak; zu, tooth	the organ sign is the speech sign
Egyptian hieroglyphs, c. 3200 BCE	uniliteral phonograms; the mouth sign is the phoneme *r*, and the word ra, mouth, also means utterance, spell, chapter	the organ is the act and the sign at once
Memphite Theology, extant copy late eighth century BCE, original dated to the Old Kingdom by Breasted, Erman, Sethe, and Junker and disputed	Ptah creates through heart and tongue; the naming of every thing by the mouth[40]	creation by utterance; the tongue as the instrument of genesis
Enmerkar and the Lord of Aratta, Old Babylonian copies	writing invented because the messenger's mouth was heavy and could not repeat the message; the same composition carries the one-tongue passage set beside Babel[41,42]	writing as the prosthesis of a failed mouth; the script downstream by the Sumerians' own etiology
Enuma elish I.1-2	when on high the heaven had not been named, below the earth had not been called by name[43]	existence coextensive with being named
Proto-Sinaitic, c. 1850-1500 BCE	acrophony: ox 'alp gives hamza, house bayt gives b, water mayim gives m, eye 'ayn gives 'ayn[44,45]	the alphabet born at the moment a speaker cuts the first segment off the spoken name of a picture; the picture is scaffold, the sound is the letter, and the event is the earliest recorded act of segmentation, a receipt of that act and never evidence that the act preceded all script
Ugaritic abecedaries, 14th-13th c. BCE	thirty signs in the order later Phoenician and Hebrew keep	the earliest fixed letter order, a memorized sound sequence
Hittite cuneiform, 17th-13th c. BCE	h where Saussure's structural coefficients required a consonant no daughter language retained[33,34]	the structure forced a sound before any script recorded it
Linear B, c. 1400 BCE	a syllabary that cannot write Greek final consonants or clusters, ti-ri-po for tripos, recovered through the grid[46]	a lossy chart of an invariant sound structure
Rigveda, composed c. 1500-1200 BCE, oral for two millennia, its category shruti, what is heard	10.71.1, the first beginnings of speech and the giving of names; 1.89.8, hearing the auspicious with the ears; the recitation orders that preserve the sound and never the sign	the highest scriptural category in the Indo-European line is hearing itself
Taittiriya Upanishad 1.2	the first lesson is shiksha: sound, pitch, quantity, force, articulation, combination	a scripture that opens on phonetics

Table 4 | The oldest scripts and scriptures, continued: the Vedic, Hebrew, Greek, Avestan, and Quranic strata, the names of scripture, and the two articulatory alphabets. Same contract as Table 3.

Stratum · date	Attesting text	What it registers
Genesis 2:19-20; 11:1	naming by sound before any script; the one language of the earth is one lip, safa ehat	the organ names the faculty; the lip, not the letter
Deuteronomy 6:4; Judges 12:6	the creed an imperative to the ear, Shema; the ear-test of identity at the Jordan fords	the ear as ruler of belonging
Aristotle, De Interpretatione 16a; Plato, Phaedrus 274-275	spoken sounds the primary symbols and written marks symbols of spoken sounds; the written word an orphan beside living speech	the Indo-European philosophical line states the script-downstream law in so many words
Avestan alphabet, c. 4th-6th c. CE, for Gathas of c. 1000 BCE	a script of some fifty signs invented to capture every nuance of a recitation a millennium and a half old	the script made to serve the sound, fifteen centuries late
Quran, 610-632 CE, transmitted by an unlettered messenger (7:157-158), the dotless Uthmanic skeleton carried by recitation[31]	*iqra'* (96:1) before *'allama bi-l-qalam* (96:4); *'allamahu l-bayan* (55:4); *'allama Adama l-asma'a* (2:31); *Nun wa-l-qalami wa-ma yasturun* (68:1), the sounded letter-name before the pen inside one verse; the fourteen of twenty-eight letters recited by name and never read as words	the phoneme foregrounded as a sounded atom; recitation before inscription; the skeleton under-determining the sound and the mouth carrying what the page did not
Quranic faculty order	hearing before sight wherever the faculties are paired (16:78; 17:36; 23:78; 32:9; 46:26; 67:23); the organ list at 7:179 runs hearts, eyes, ears, so the order is a faculty-register regularity and not universal	hearing seated first at the faculty register, the exception stated
30:22 against Sanskrit varna	*ikhtilafu alsinatikum wa-alwanikum*, tongues and colours paired as one kind of sign; Sanskrit varna carries both colour and speech-sound in one word	two families reading phonemic distinction and chromatic distinction as one species of variety; conceptual convergence, not cognate
scripture as chant	Vedic recitation carries accent by pitch; *wa-rattili l-qur'ana tartila* (73:4), recitation ordered as measured chant; the Gathas are songs by their own name	the prosodic and vowel carrier the consonantal script omitted is what the mouth kept[19,20]
the name of the scripture	shruti, what is heard; miqra', what is called out; qur'an, recitation, the last two on one Semitic root; Avestan manthra, utterance; reading itself a mouth-act, Augustine's astonishment at Ambrose reading silently, Confessions VI.3[30]	the scriptural traditions name their scripture by the ear and the voice
the letter names as sound fossils	alpha, beta carry ox and house into Greek where they mean nothing; abjad, futhark, and the Arabic 'ayn still meaning eye	the ear kept what the mind lost; letter names are sound units first
the two articulatory alphabets	al-Khalil's Kitab al-'Ayn, eighth century, ordered from the deepest throat letter to the lips[47], and his enumeration of the letters' permutations, used against unused; the Sanskrit varnamala, its five stop series walking from the velum to the lips, the Paniniya Shiksha counting eight places[48]; Sibawayhi's sixteen places; Ibn al-Jazari's seventeen in five regions	two traditions ordering the inventory as a walk from the throat to the lips; the alphabet as a map of the mouth; an exhibit and not a bijection, the counts never fitted; independence of the two traditions open[49]

6 The three-consonant root audited

The most famous count in Semitic is the three-consonant root, and a reader of the two preceding sections might take it for a signature of the floor. It is not, and the audit is worth printing because the temptation is general: wherever three recurs, a triadic explanation is offered. The token is re-indexed first. *Triliteral* is a letter-count name; at the phonic register the count is a segment count, and where the letter count and the segment count differ the difference is itself the finding. They differ across a large class. A root with a weak radical, *w*, *y*, or the glottal stop, and a geminate root with a doubled second radical, are three letters on the page and two consonantal segments in the mouth across much of the paradigm: q-w-l surfaces as qala, s-y-r as sara, m-d-d as madda, the middle radical a long vowel or a length, never a third closure. The classical grammarians drew the class themselves, sound against weak and geminate, so the preponderance of triliterals is in part a fact about the page and the template and not about the tract.

The distribution decides the rest. The three-segment preponderance is a Semitic fact. Proto-Afroasiatic is reconstructed with a largely two-consonant root by one school, the third radical an augment or determinative[50,51,52], the reading contested; the Indo-European root is CeC, two consonants around an ablauting vowel, extended by suffix and enlargement[53]; the Sinitic morpheme is a monosyllable and the

Austronesian root a disyllable. A floor signature holds across families; this pattern stops at the Semitic border, which is what a family-level innovation looks like and what an imprint of the floor would not look like. The claims of the two paragraphs above are now measured rather than cited. The complete root inventory of the Quran, extracted from the public morphology corpus[62] and normalized on the glottal and alif letters, holds 1,651 distinct roots as annotated by the corpus, on 50,269 root-bearing tokens, 1,608 of them annotated at three letters and 43 at four, none at two letters, since the annotation writes weak roots at three letters. Of the 1,608 three-letter roots, 591 carry a weak radical, 36.8 per cent, and 149 are geminate, 9.3 per cent, so 740 roots, 46.0 per cent, are three letters on the page and two closures in the mouth across much of their paradigm: the letter count and the segment count part on nearly half the inventory, which is the finding the re-indexing predicted. The third slot's freedom is then measured and not only bounded: over the 1,608 three-letter roots the conditional entropy of the third radical given the first two is 2.047 bits, against 3.987 bits for the second given the first and a uniform bound of 4.755, with 482 distinct first-radical pairs attested and a mean of 3.34 third-radical continuations per pair, the maximum 14. And the constraint that shapes the code is replicated on the same set: no root carries identical first and second radicals, 154 carry identical second and third, the 149 geminates and five doublings of a weak radical counted under the weak class, and under a declared five-class place partition homorganic adjacent pairs occur at 0.681 of their independence expectation across 3,216 adjacencies, which is the homorganic-avoidance constraint reported on Semitic roots half a century ago[54] and modelled since as similarity avoidance[63], recovered here on the Quranic set; the ratio and the constrained counts are functions of the declared partition, and under a finer eight-class partition, dentals, sibilants, and liquids separated and the pharyngeals parted from the laryngeals, the ratio falls to 0.492 while the admissible counts move to 666 at two segments and 15,930 at three, so the avoidance strengthens and the least sufficient length does not move. The forcing that does exist is combinatorial and not geometric, and Box 1 executes it.

Box 1 | The least sufficient root length, executed

Under the adjacency constraint alone, no identical adjacent consonants[54], an inventory of n consonants admits $n(n-1)^{k-1}$ ordered skeletons of length k, so the least sufficient length for a demand $D > n$ is $k(D, n) = 1 + \lceil \ln(D/n) / \ln(n-1) \rceil$. At $n = 28$, the Classical Arabic inventory, the counts are 756 at $k = 2$ and 20,412 at $k = 3$. For any lexical demand between 757 and 20,412 roots the least sufficient length is therefore three, and the measured Quranic demand of 1,651 sits inside the window, $k(1{,}651, 28) = 3$. Under the stricter place constraint of Section 6, the same five-class partition with no homorganic adjacency, the counts fall to 536 at $k = 2$ and 11,008 at $k = 3$, and three remains least sufficient by a factor of 3.1 above the two-segment supply and 6.7 below the three-segment supply. The closed form also states the two limits: $k(1{,}651, 10) = 4$, small inventories reaching for longer roots, and $k(1{,}651, 42) = 2$, an inventory of forty-two or more consonants able to carry a Quranic-sized lexicon on two segments, which the large-inventory languages of the Caucasus, with their short roots, are consistent with at E3. The classical dictionary demand near 6,000 (E3) also falls inside the window, $k(6{,}000, 28) = 3$, so the result is insensitive to the demand across the whole window. The least sufficient length rises as the inventory falls, 810 at ten consonants and three, so small-inventory languages reach for longer roots, which the Austronesian disyllable corroborates. Three is the least sufficient length relative to an empirical demand: a lower bound, a sufficiency, and not a geometry, and never a prediction of actual length. Al-Khalil's own enumeration of the permutations of the letters, the used against the unused, treats the root as a combinatorial object drawn from an inventory[47], the first lexicographer's own record that a radical is a position in a code. Warrant: the arithmetic exact and re-derived for this paper; the Quranic demand E1, derived from the corpus as annotated; the dictionary demand E3; the reading structural.

The strong identification, the three radicals as three independent dimensions of meaning, breaks on three tests. The three radical positions draw from one inventory, so no assignment of distinct roles to the positions survives; deleting a radical returns another lexeme or none, never the incoherent residue of one word; and given the first two radicals the third carries 2.047 bits of freedom in the attested Quranic lexicon, up to 4.755 under the adjacency constraint alone, so it is drawn, never forced, where a forced third element would carry none. The clean positional-semantic law that would rescue the identification was reached for twice in the tradition, by Ibn Jinni's greater derivation, the claim that the permutations of a root share a sense[55], and by the matrix-and-etymon theory[56], and neither delivered it at the standard of regular correspondence. What survives, as a reading and never as a result, is that the Semitic word is a three-tier object, the consonantal root on one tier, the vocalic melody on a second, the CV template on a third[57], one skeleton actuated as kataba, kutiba, yaktubu; and that the Indo-European word reaches three by concatenation, root, suffix, ending[53]. These are threes of positions. The *a i u* triangle of Table 2 is a three of acoustic corners. The paper

identifies none of them with any other, and fences the identification in Section 8.

7 Falsification

Three criteria, the ceiling, each forced by the paper's own geometry, each naming one claim of this paper and nothing above it, each with its binding conditions stated so a reader can tell a miss from a hit. Falsification is an invitation to an external reader and not the paper's foundation.

F1, nursery immunity to sound law. Forced by the regeneration face. Prediction: in any family whose sound laws are established on the core lexicon by regular correspondence, the nursery forms for mother and father do not undergo those laws, the shifted inherited form and the unshifted nursery form standing side by side, as English *father* under Grimm's law beside unshifted *papa*. Null: nursery forms obey the family's sound laws at the same rate as the core lexicon, tested by the regularity check of the comparative method itself. Firing event: a family in which the mother and father nursery forms show the family's regular reflexes with no unshifted doublet. Binding conditions: the sound laws independently established; the nursery register identified by the language's own usage and not by the analyst. The statistic is fixed here: for each family j, p_j is the proportion of nursery lexemes for mother and father whose attested form shows the family's regular reflex of the relevant consonant, q_j the same proportion over the core lexicon under the same law; the null is $p_j = q_j$, the prediction $p_j < q_j$, and the criterion fires in any family with at least two independent nursery lexemes returning $p_j \geq q_j$, a borrowed nursery form excluded only where a loan trajectory is documented and never on inspection. What falls if it fires: the regeneration face of Section 2, and with it the floor's distinction from inheritance, which is the sharpest thing this paper can volunteer against itself.

F2, script-independence of the residue. Forced by the receipt law. Prediction: the shape-sound and sound-meaning biases persist unchanged in script-naive populations tested with auditory stimuli. Null: the effect present in literate populations and absent in script-naive ones at the same auditory task. Firing event: a controlled auditory test in a verifiably unlettered population returning chance where literate controls return the effect. Binding conditions: auditory presentation, no letter shapes; the stimulus set fixed and its phonotactic admissibility for the listener's language certified and recorded before any subject is tested, never judged after the outcome, since the Syuba result shows an impossible word returns no mapping and that is the mechanism confirming, not the mechanism failing[24]. What falls if it fires: the receipt law of Section 3, the floor becoming a literacy artifact. Run once and survived, at the strength one replication carries[23].

F3, independence of the generators under the descent projection. Forced by the regeneration face read at the production grain. Prediction: the sizes of the three generators, consonant, vowel, and tone inventories, remain independent when family means are removed, since a floor rebuilt in each speaker couples nothing along lineages. Null: the counts are coupled within families as they are between them. Firing event: on a public inventory database with families assigned from a public reference, the family-demeaned three-row frame returning a Gram volume below the all-inventory volume, since projecting descent out cannot lower the independence if descent is what couples, or any family admissible under the instrument's own frame floor whose three-row frame returns a collapse or a bootstrap-unstable lock. Binding conditions: inventories and families taken from published databases at stated digests, no inventory hand-edited, families with fewer than two inventories excluded, a family whose tone row is constant refused rather than read. What falls if it fires: the regeneration reading of Section 3's inventory residue, and nothing above it. Executed once and survived: 0.993 on the residual frame against 0.921 on the full frame, Atlantic-Congo 0.975, Indo-European 0.999, Afroasiatic 0.920, Sino-Tibetan 0.889, Austronesian 0.958, Pama-Nyungan refused on a constant tone row (Appendix A, Box 4).

A tripwire beneath the criteria. If al-Khalil's throat-to-lips order is shown to descend from the Indian phonetic tradition, the conjecture raised and not proved[49], the two-alphabets row of Table 4 loses its independence and that convergence collapses to one witness. This fires against one exhibit and against no claim of the floor; it is carried so the exhibit's grade can be told from the paper's.

8 Discussion

What this paper contributes. The results this paper cites are classical, and the paper authors none of them; its contribution is the arrangement, the typing, three runnable tests, and one executed independence, and the honest way to state that is against the ledger of what the literature already holds. The cross-family biases are Blasi and colleagues'[1] and the iconicity program around them[58,59]. Categorical reception in infants and non-human listeners is Eimas's and Kuhl's[12,13,14]. The lattice is Stevens' and Lindblom's[6,7,8], and its self-organization was simulated before this paper[9,10]. Nursery regeneration is Jakobson's and Murdock's[16,17]. The channel argument is Hockett's[18], and song before word is Darwin's and Mithen's[19,20]. That segmentation derives from alphabetic writing is widely held[25,26,27,28,29]. That scripture names itself by the ear is Graham's[30]. The Semitic root's constraints are Greenberg's and its tiers McCarthy's[54,57]. The comparative ceiling is Nichols' and Ringe's[2,3]. Against that ledger, four things are not held there, and each is stated at its grade.

First, the typing. The literature reports the cross-family biases and stops at the human condition as their unknown cause; the iconicity program treats non-arbitrariness as a property of language. This paper names the cause as a floor beneath descent, bounds it by the four faces, forces it by the projection argument of Section 3, and types the prefix: not a language older than the macro-families, a generator beneath every family in kind, present in every infant. The framing does two things the literature's framing does not. It explains why the comparative method cannot reach the regularities, since a generator that is regenerated leaves no correspondence to read, and it predicts where the regularities must stop, at the boundary of the apparatus,

which the Syuba failure and the signed-language profile both mark. Grade: structural.

Second, a test nobody has run at scale. Jakobson argued the immunity of nursery forms to sound law qualitatively. F1 states it as a corpus study across families with established laws, Germanic under Grimm and Verner, Armenian, Romance, Semitic, with the null and the firing event fixed in advance. It is the single most valuable object in the paper because it is a study and not a hypothesis, and because its firing would collapse the floor into the inheritance it refuses. Grade: a pre-registered prediction, forced.

Third, the receipt roster read as one class under the two-cut distinction. The rebus, acrophony, the Greek transfer of gutturals into vowels, the lossiness of Linear B, the two articulatory alphabet orders, the dotless Quranic skeleton carried by recitation, and the Avestan script made fifteen centuries late are each known singly. Read together as receipts of a perceptual cut that precedes them, with acrophony re-read as the earliest recorded act of segmentation rather than as evidence that segmentation preceded literacy, they extend Faber's epiphenomenon thesis[27] into a dated event and reconcile it with the categorical-perception results, which the two literatures have not done for each other. Grade: structural, on documentary rows that carry no terminal strength.

Fourth, the root audit, and this is where the paper carries measured findings rather than arrangement. The least-sufficient-length statement of Box 1 is elementary and may be known informally; the paper states it as a closed form, $k(D, n) = 1 + \lceil \ln(D/n) / \ln(n - 1) \rceil$, shows it stable under the place constraint, and reads its two limits. Three numbers on the complete Quranic root inventory, as the corpus annotates it, are, as far as the paper can find, unreported: the third radical carries 2.047 bits given the first two, the number that separates a code position from a forced dimension, which carries none; 46.0 per cent of the three-letter roots are two closures in the mouth, the letter count and the segment count parting on nearly half the inventory; and the homorganic-adjacency constraint recovers at 0.681 of independence on this set with the identical-pair asymmetry exact, zero at the first joint and 154 at the second. The audit's value is corrective: it removes the three-consonant root from the class of floor signatures where a triadic reading would otherwise place it, and it does so with the family border, the letter-count re-indexing, and the corpus, not with a preference. Grade: exact on the arithmetic, E1 on the corpus figures, structural on the reading, E3 on the dictionary demand.

Fifth, the ladder and its executed rung. The floor read inward as one triad at seven grains is arrangement, and the paper claims it at structural grade; its production grain is executed, and there the paper carries a finding: the three physical generators of speech are nearly independent across the world's inventories, 0.921, and almost perfectly independent once descent is projected out, 0.993, while the family means couple at 0.678. The weak coupling of consonant and vowel counts was reported[99]; the three-way volume with the phonation axis, and its behaviour under the descent projection, are, as far as the paper can find, unreported. Grade: E1 on the counts, structural on the reading.

Sixth, the loop as an exhibit. The speech loop as a damped self-witnessing recurrence with a 200 ms carrier found in three literatures is stated here at structural grade and claimed as nothing more than the arrangement; each leg is the literature's own.

Against the generative program. Whether the floor supersedes the generative account of language is asked directly, and answered by register first. The program's load-bearing claims are syntactic, hierarchical structure built by a single combinatorial operation, structure dependence, the poverty of the stimulus, and in its minimalist form the identification of the faculty in the narrow sense with recursion alone[100,101]; the floor is phonic and lexical, and a claim at one register supersedes nothing at another. The floor says nothing about how a clause is built. It does contradict three named positions, each on measured ground. The substance-free reading of phonology, the innate universal feature set read as formal primitives[102,103]: the floor derives the features from tube and ear, and the three oral place classes are present in one hundred per cent of the world's inventories (Appendix A, Box 4), which a substance-free account has to stipulate and a substance-based account derives, the standing dispute between the two phonologies joined on the second side with new counts. The arbitrariness of the sign as a foundation: iconicity is the seed and arbitrariness the accretion. And the minimalist thesis that externalization is ancillary to the faculty and the locus of mere variation[101]: this is the sharpest point, since the only exceptionless universals in the data live in the externalization substrate, the place lattice at one hundred per cent, the vowel corners at eighty, the three independent generators, while the syntactic universals the program proposes are carried by argument; ancillary is the wrong word for the register that holds the universals. Where the floor complements the program rather than competes with it is also stated: the program hands the sensory-motor interface to biology and does not theorize it, and the floor is a theory of exactly that interface. Its kin are the gesture as the phonological primitive[104], the frame-content account of the syllable[89], the mirror-system and imitation-first accounts[105,106], the vocal-tract account of the descended larynx[107], and the phonological loop as the evolutionary core of the language areas[96], the one bridge from the vocal-hearing complex toward syntax the literature already carries. The one place the two programs share a subject is the propositional register: the three-slot decomposition of any truth-claim[64] is a universal there, forced by a deletion test rather than stipulated, but a triad is not a syntax, and recursion is permitted by its relation slot and not forced by it. Whether hierarchical syntax has a floor of its own is held open.

What this paper does not contribute, stated so it is not over-read. It does not supersede the generative program; the fence of the preceding paragraph binds this paper first. It does not validate or refute any macro-family; the floor is orthogonal to descent and moves the Nostratic question nowhere. It does not make iconicity the ceiling of the lexicon; the biases cover a considerable proportion of the hundred basic items and never the lexicon, and arbitrariness stands

over the bulk of any vocabulary. It does not admit letter shape as evidence; the shape-sound effect is no stronger where a script's letter shapes are congruent with the referent, and it holds where there is no script[22,23]. It does not identify the *a i u* triangle, the three tiers of the Semitic word, or the three positions of the Indo-European word with one another: the first is a count of acoustic corners under two formant dimensions, the others are counts of positions, and a count reached in two registers is a witness to nothing above the count. It makes no theological claim; the scriptural rows are data, and the paper's use of them is as texts placing the mouth before the pen. And it does not claim that the two articulatory alphabets prove a common source; two traditions walking the tract from the throat to the lips is an exhibit of the floor's availability to any ear that looks, and the counts, sixteen, seventeen, eight, five, are never mirrored or fitted.

Limits and open questions. Six openings are located and left open, and the census below lists them. The neural rungs of 2.2 are cited and not executed, and their imprint waits on a re-run dataset rather than a citation; the bridge from the loop of 2.3 to syntax waits on a derivation nobody has written. Monogenesis, whether there was one first language, is decided by nothing here; the floor explains convergence without needing it. The pre-literate status of segmental awareness is the sharpest: the paper holds the receipt law on the perceptual cut and leaves the segmental cut open, with the illiterate-adult deletion results as the standing counter-witness[28], and the question whether ancient India practised segmental phonology under a non-alphabetic script[60] is the test that would move it, since a segmental analysis under a syllabary would push segmentation pre-alphabetic without making it pre-literate. The independence of the two articulatory alphabets awaits an attribution study on the conjecture of Indian influence[49]. Two further limits bind the evidence itself. The script-naive replication has been run once[23] and needs the pre-registered form F2 states. And the documentary rows of Tables 3 and 4 are literature-mediated throughout; they attest placement and would not carry the argument if the measured rows fell.

On the three-state economy of the claims. The paper's claims come in three states and no fourth. Sealed at structural grade: the floor as placement, the receipt law on the perceptual cut, the ladder as arrangement, the independence of the three generators as an executed finding. Open: monogenesis, segmental awareness, the alphabets' independence, the three-consonant root as an imprint of anything beyond sufficiency, the neural rungs' imprint, the bridge from the loop to syntax. Broken, by the paper's own tests: the radicals as dimensions, iconicity as the ceiling, letter shape as evidence, descent read off convergence. A reader who declines the discipline under which the paper was developed carries every row, because no row rests on it; the method is disclosed in the appendix and adds the cited results no warrant.

How the paper stands to each prior position. A paper that sits across phonetics, historical linguistics, writing systems, Semitic philology, and the neuroscience of speech owes its readers one statement of where it stands to each of them, in words whose senses are fixed. Seven words are used and defined once. Additive: the paper supplies a result or a test the position lacked and leaves it standing. Replacing: a metaphor or framing is retired and a measured object put in its place. Subsuming: the prior claim becomes a case or a consequence of the floor. Corroborating: independent agreement, which confers no warrant and is counted as none. Contradicting: a named thesis is denied on executed data and never on argument alone. Competing: a different position on the same question, argued and not executed. Scoping: the prior claim is kept inside a stated boundary. Superseding is used nowhere, because the paper supersedes no theory and has said so. On that vocabulary the census is this. One position is replaced, the blank slate: at the phonic register the surface has a grain, the lattice innate because it is anatomy and the inventory learned because it is pruned into it, neither module nor slate, which is a third position in the oldest dispute of the field. Three theses are contradicted, each on executed data: the substance-free reading of phonology, the arbitrariness of the sign as a foundation, and the ancillarity of externalization. One is competed with on argument: that language is not for communication. Four positions are subsumed: the iconicity program's unnamed cause, the descent-or-chance dilemma of the macro-family debate, the design features as a list, and the control-loop accounts of speech. Three are added to on data: the quantal and dispersion accounts, the Semitic root theories, and the nursery-word argument, the last by a test rather than a result. Four are corroborated with no warrant claimed: the comparative ceiling, the root constraints, the literacy account of segmentation, and the orality of scripture. Three are scoped or reconciled, and two are kin held open. Tables 6 to 8 carry the rows, and each row states the evidence it rests on in one word, so that a reader can tell at once which relations stand on the two databases and the corpus, which on the literature, and which on argument. The discussion closes on those tables, because the paper's contribution is exactly the set of relations they state and nothing wider.

Table 6 | How the paper stands to each prior position, part 1 of 3, rows 1 to 8. Relation words as defined in the text; superseding is used nowhere. Evidence: executed, cited, argued, or documentary.

Prior position	What it holds	What this paper does with it	Relation	Evidence
Tabula rasa; behaviourist learning (Locke; Skinner 1957)	Language is learned onto a blank surface.	The surface has a grain. The lattice is innate because it is anatomy; the inventory is learned because it is pruned into that lattice (perceptual narrowing at 6 to 12 months). Neither module nor slate.	Replacing	Cited: Werker and Tees 1984; Kuhl 1992; Eimas 1971; Kuhl and Miller 1975
Universal Grammar; narrow faculty as recursion (Chomsky 1965; Hauser, Chomsky and Fitch 2002; Berwick and Chomsky 2016)	An innate syntactic computation; externalization ancillary and the locus of mere variation.	Says nothing about syntax and supersedes nothing there. Fills the sensory-motor interface the program hands to biology. Contradicts ancillarity: the only exceptionless universals in the data, three place classes at 100 per cent, vowel corners at 76 to 81, three independent generators, live in externalization; the syntactic universals are carried by argument.	Additive at the interface; contradicting on ancillarity	Executed: PHOIBLE, 3,020 inventories
Substance-free phonology; innate universal features (Chomsky and Halle 1968; Hale and Reiss 2000)	Distinctive features are formal primitives, stipulated.	Derives the features from tube and ear (quantal plateaus, categorical boundaries) and supplies counts a substance-free account must stipulate.	Contradicting	Executed counts; Stevens 1972, 1989 cited
Arbitrariness of the sign (Saussure 1916)	The sign is arbitrary at its foundation.	Iconicity is the seed and arbitrariness the accretion; as a foundation the postulate is retired, as a description of the bulk of any vocabulary it is kept.	Contradicting as foundation; retaining as description	Blasi et al. 2016 read; projection argument
Iconicity program (Blasi et al. 2016; Dingemanse et al. 2015; Perniss and Vigliocco 2014)	Non-arbitrariness is pervasive; its cause is left as the human condition.	Names the cause as a generator, bounds it by four faces, types it infra-Nostratic, forces it by a three-projection argument, and requires a boundary failure before any iconicity claim counts.	Subsuming	Read: Blasi 2016; Ćwiek 2022; Styles and Gawne 2017 for the boundary
Nostratic and its critics (Illich-Svitych; Bomhard; Ringe 1995; Campbell)	Cross-family resemblance is descent, or it is chance.	A third option: regeneration. The descent question is left exactly where it stands; the resemblances no longer need it.	Subsuming the dilemma	Argued; executed independence supports the third option
Comparative-method ceiling (Nichols 1992; Ringe 1995)	Correspondence signal is lost beyond eight to ten millennia.	Agrees, and explains why the regularities survive it: a regenerated generator leaves no correspondence to read.	Corroborating with a mechanism	Argued
Nursery words (Jakobson 1960; Murdock 1959)	mama and papa are regenerated from infant articulation.	Generalized to the whole floor; stated as a corpus test across families with established sound laws, statistic and firing condition fixed.	Additive	Test stated, unrun

Table 7 | How the paper stands to each prior position, part 2 of 3, rows 9 to 15. Same contract as Table 6.

Prior position	What it holds	What this paper does with it	Relation	Evidence
Design features (Hockett 1960)	Vocal-auditory channel, interchangeability, total feedback, listed.	Gives each its physics: source-filter and cochlea as Fourier duals, the loop's gain and phase, same-kind mimicry as the selection story.	Subsuming	Fant 1960; Békésy 1960; Guenther 2006 cited
Quantal theory; dispersion; self-organizing inventories (Stevens; Liljencrants and Lindblom 1972; de Boer 2000; Oudeyer 2006)	Inventory shape follows from tract and ear.	Taken as the production face; adds the independence of the three generators across the world and its sharpening under the descent projection.	Additive on data	Executed: 0.921, 0.911, 0.993
Speech is special against auditory-general perception (Liberman; Kuhl and Miller 1975)	Boundaries are motor, or they are auditory.	Both, at different rungs: the boundary is auditory-mechanical (chinchilla, one-month infant); the loop is motor-coupled (dorsal stream, mirror activation).	Reconciling	Cited
Literacy makes the phoneme (Olson 1994; Faber 1992; Morais et al. 1979; Ziegler and Goswami 2005)	Segment awareness derives from alphabetic literacy.	Accepted. The script-downstream law is scoped to the perceptual cut; acrophony is re-read as the earliest recorded act of segmentation; the India question (segmental phonology under a non-alphabetic script) is named as the test.	Corroborating and scoping	Cited; open
Phonetization of writing (Gelb 1963)	Logogram to syllabary to alphabet.	Every phonetization event, rebus, acrophony, the Greek guttural-to-vowel transfer, Linear B's lossiness, is a receipt of an ear-cut; script is downstream by construction.	Reframing	Documentary
Orality and scripture (Ong 1982; Havelock; Graham 1987)	Scripture is recited and heard before it is read.	A dated roster of scripts and scriptures placing the mouth before the pen, the chant row, the scripture names by the ear.	Corroborating	Documentary
Semitic root theories (Hurwitz 1913; McCarthy 1981; Bohas and Dat 2007; Ibn Jinni)	Three radicals as structure, tiers, or meaning-bearing matrices.	The root is a code of least sufficient length under a combinatorial constraint, with a closed form; on 1,651 Quranic roots, 46 per cent are two closures in the mouth, the third slot carries 2.05 bits, and the radicals are positions, not dimensions.	Correcting; additive on data	Executed on the Quranic corpus

Table 8 | How the paper stands to each prior position, part 3 of 3, rows 16 to 22. Same contract as Table 6.

Prior position	What it holds	What this paper does with it	Relation	Evidence
Root constraints (Greenberg 1950; Frisch, Pierrehumbert and Broe 2004)	Homorganic adjacency is avoided.	Replicated on the Quranic set: 0.68 of independence, and the asymmetry exact, zero identical pairs at the first joint against 154 at the second.	Corroborating	Executed
Articulatory phonology; frame-content (Browman and Goldstein 1992; MacNeilage 1998)	The gesture is the primitive; the syllable is a jaw cycle.	The mouth cuts; the syllable is the loop's carrier at about 200 ms.	Kin	Cited
Control-loop and predictive accounts (Guenther 2006; Houde 2002; Friston 2010)	Speech is a feedback-controlled, prediction-driven loop.	The loop read as a damped self-witnessing recurrence at two grains, milliseconds within a speaker and seconds between speakers, its 200 ms period found in the syllable, delayed feedback, and turn-taking.	Subsuming; additive exhibit	Cited; the convergence an exhibit, not a claim
Phonological loop as the origin of the language areas (Aboitiz and García 1997; Aboitiz 2012)	Auditory-vocal working memory is the evolutionary core.	Held as the one bridge from the floor toward syntax, open; reached independently by the author from sensory constraints in 2014, the two roads converging.	Kin; open	Cited
Gesture-first against vocal-first origins (Corballis; Arbib; Darwin 1871; Mithen 2005)	Which channel came first.	A channel is a floor wherever its receiving organ has an emitting twin; the vocal channel wins for same-kind mimicry at distance, and signed languages are predicted to be iconic, which they are.	Scoping	Cited
Language is not for communication (Chomsky)	Communication is a by-product.	Broadcast transmission, interchangeability, and total feedback are a communication design; the floor sides with the design.	Competing	Argued on Hockett's features, not executed
Nativism against empiricism (Spelke; the modularity debate)	Innate modules, or none.	At the phonic register a third position: innate lattice, learned inventory.	Third position	Argued on executed counts

9 Conclusion

Beneath every reconstructible family there is no older language, only the mouth and the ear: a finite lattice of stable closures, the corners of a bounded vowel space, and the category boundaries the ear imposes, regenerated in every infant, presupposed by every reconstruction and a premise in none. Unrelated families converge on the same sound-meaning pairings because they share the generator and not an ancestor, and the comparative method cannot reach the generator because it leaves no correspondence to read. Every script that became phonetic recorded a cut the ear had already made, and the oldest scripts and scriptures attest the order by placing the mouth before the pen. The three-consonant root is not a signature of this floor; it is a code of least sufficient length. Read inward, the floor is one triad at seven grains, and at its physical grain it is executed: the three generators of speech vary independently across the world's languages and almost perfectly independently once descent is projected out. Three forced tests are stated; the first, nursery immunity to sound law across families, is the study the argument most needs and the field does not yet hold, and the third has been run once and survived.

Appendix A · Structural battery and receipt

The claim of this paper is structural, and a structural claim owes a receipt, the word used here in its plain sense of an executed record and not in the sense of Section 3, where a script is the receipt of an ear-cut: a demonstration that its three declared aspects are distinct and enclose volume, executed at machine precision, reproducible from the paper's own text at a declared seed. The apparatus in this appendix is the author's method, quarantined here; it carries no result for the thesis, whose warrant rides the cited studies and the three criteria of Section 7. The battery, UF-CHK, runs on rows derived from Tables 1 and 2 by three printed rules, so that a reader can rebuild the frame from the tables and re-execute every line.

The frame. Twelve contexts, one per exhibit row of Tables 1 and 2. Three warrant rows. V_F, the formal-structural aspect, is the number of distinct tract-field terms the Mechanism cell names, from a fixed list of twenty-seven (nasal, labial, fricative, stop, trill, sibilant, guttural, uvular, velar, lateral, glottal, pharyngeal, voiced, voiceless, egressive, ingressive, liquid, front vowel, formant, closure, opening, release, oscillation, turbulent, puff, reduplicat- covering reduplication and reduplicated, airflow), matched as substrings of the cell text. V_E, the

empirical aspect, is the evidence score of the row, two for a tier-E2 row and one for E3, plus one where the Mechanism cell carries a superscript citation to a named study. V_ER, the registrational aspect, is one for the Arabic column plus the number of distinct attesting lines named across the three language cells, from a fixed list of twenty-two family and tradition names (Sumerian, Egyptian, Akkadian, Hebrew, Ugaritic, Sanskrit, Greek, Latin, Hittite, Gothic, English, German, Slavic, Old Norse, Quechua, Greenlandic, Judges, Ultan, PIE, Phoenician, Brahmi, Semitic), matched as substrings of the cell text. The rows are content-derived and coarse, integers on small ranges, and they are read only for what they are: three separable aspects of the exhibit set, mechanism specificity, evidence grade, and breadth of attestation.

Table 5 | The UF-CHK frame: three coded aspects of the twelve paired exhibits, derived from Tables 1 and 2 by the printed rules.

Exhibit	V_F	V_E	V_ER
mother, father	4	2	7
tongue = language	1	3	5
nose, breath	4	3	4
breath out, breath in	9	1	3
round, turn, roll	3	3	4
strike, knock, crack	5	3	4
whisper, hiss, shriek	4	1	4
swallow, throat, choke	1	1	3
the guttural stratum	2	1	7
the small vowel	2	3	3
babble = foreigner	2	1	6
the three short vowels	3	2	5

The instrument. Each row is centred and scaled to unit variance, normalized to a unit vector over the twelve contexts, and the three unit rows form the correlation Gram R. Read as pure quaternions under an isometry of their span, the scalar part of their triple product is λ, and the closed-form identity $\lambda^2 = \det(R)$ binds the algebraic and geometric faces of the verdict; the determinant is the squared volume the three rows enclose, bounded in the unit interval, zero on collapse, and invariant under reflection of any row, which is why it carries no sign and no truth-value. The verdict token reads the dimensionality of the frame and nothing more.

Box 2 | UF-CHK · executed receipts at seed 20260622, N = 12, double precision

UF-CHK.1, the lock. Verdict LOCK. $\lambda = -0.926036880366$. det(R) = 0.857544303797. det(G) = 0.857544303797, the rows unit so the two Grams coincide. Identity $|\lambda^2 - \det(R)| = 1.776 \times 10^{-15}$. Four estimators of det(R), LU, eigenvalue product, Cholesky, cofactor, spread 1.110×10^{-16} within the conditioning-scaled tolerance 1.908×10^{-15}. $\kappa(R) = 2.1486$ against a gate of 10^6. Collapse margin 12.51 orders; conditioning margin 5.67 orders. Off-diagonal correlations r_FE = −0.1307, r_FR = −0.2687, r_ER = −0.1982: the three aspects do not track one another. UF-CHK.2, orientation blindness. Reflecting V_E on a basis fixed once by QR: λ moves from −0.926036880366 to +0.926036880366, ratio −1.000000; $|\det(R) - \det(R)'| = 0.000 \times 10^0$ exactly. The magnitude is bit-identical under the flip and the signed scalar inverts, so the lock reads volume and not direction. UF-CHK.3, the deletion test. Zeroing any one row routes the kernel to the zero-variance refusal and no determinant issues; deleting any one row leaves a two-axis area, 0.9607, 0.9278, 0.9829, and no volume. Three slots, each load-bearing, none derivable from the other two. UF-CHK.4, frame invariance. One thousand random rotations of the coordinate triad: max $|\Delta\lambda| = 1.332 \times 10^{-15}$. The verdict reads the count and the invariant, never the coordinate labels. UF-CHK.5, stability. Two thousand bootstrap resamples of the twelve contexts: agreement 1.000 on 2,000 valid resamples, stable. UF-CHK. 6, the isolation test. The three slot vocabularies declared for the claim, lattice, plateau, closure, formant, corner, boundary, categorical against infant, regenerate, nursery, suckling, rebuild, transmitted against script, receipt, rebus, acrophony, phonetization, letter, are pairwise disjoint: all three intersections empty. UF-CHK.7, the root count. At n = 28, 756 two-segment and 20,412 three-segment skeletons under the adjacency constraint; at n = 10, 810 three-segment; the least sufficient length for any demand in (756, 20,412] is three; the third slot's freedom given the first two is at most $\log_2 27 = 4.755$ bits. Receipt digest of the frame and kernel outputs, SHA-256, first sixteen hexadecimal digits: 084c8fbefc62dc04. Warrant: exact on the arithmetic and the identities; engineering-grade on the coding rules, which are printed and reproducible; the lock certifies the frame's dimensionality and licenses nothing about the thesis's truth, which is what the three criteria of Section 7 are for.

Reading the receipt honestly. The lock is strong under this coding, 0.8575 against a ceiling of one, and the figure belongs to the coding: the two lists are author-chosen, the names list is a breadth count that mixes families, traditions, a biblical book, and a survey author, and a families-only recoding of V_ER returns 0.9038, so the magnitude moves with the rule, upward here, and the dimensionality does not. Its off-diagonals are small and negative, which says one thing about the exhibit set that is worth saying: the rows with the most specific articulatory mechanism are not the best-evidenced rows, and neither is the most broadly attested, so the three aspects under which an exhibit can be judged are separable in fact and not only by declaration. That is the whole content of the structural receipt. It is not evidence that the floor exists; it is evidence that the paper's three aspects are

three, and that the frame on which the paper reasons is not one aspect wearing three names.

Box 3 | QR-CHK · the Quranic root inventory, executed receipts

Source: the public morphology corpus of the Quran[62], 130,030 segments, 50,269 carrying a root tag; the file's SHA-256, first sixteen hexadecimal digits, 742bfac59941b2cb; the glottal and alif letters normalized to one radical. Distinct roots 1,651; length distribution three 1,608, four 43. Weak-radical triliterals 591; geminate 149; sound and non-geminate 868. Entropies over the 1,608 triliteral types: H(C1) = 4.618 bits, H(C2 | C1) = 3.987, H(C3 | C1, C2) = 2.047; distinct first pairs 482; mean continuations 3.34, maximum 14. Identical adjacent radicals: first joint 0, second joint 154. Place partition declared: labial b f m w; coronal t th d dh ṭ ẓ r z s sh ṣ ḍ l n; palatal j y; dorsal k q gh kh; guttural ʿ ḥ h and the glottal. Homorganic adjacent pairs 639 observed against 938.9 expected under independence of the two positions, ratio 0.681. Admissible skeletons under this partition with no homorganic adjacency: 536 at k = 2, 11,008 at k = 3. Record digest 18f2f997ec5cfd26. QR-CHK.8, one kernel run on a measured frame. Twenty-eight contexts, the consonants; three rows, admissible partners under the place constraint, token frequency as first radical, distinct attested second-radical partners. LOCK, $\lambda = -0.747345682912$, det(R) = 0.558525569767, identity residual 2.220×10^{-16}, four-estimator spread 1.110×10^{-16}, $\kappa(R) = 4.4415$, reflection ratio −1.000000 with det bit-identical, bootstrap agreement 1.000 on 2,000. Correlations +0.378, +0.335, +0.577: the formal constraint does not fix usage and usage does not fix breadth, which is the freedom of the code read on the inventory itself. Engineering-grade; a receipt of separability and nothing more.

Box 4 | FL-CHK · the three generators on the world's inventories, executed receipts

Source: the cross-linguistic phonological inventory database[98], development file at SHA-256 c5b0c2c6d375f113, 3,020 inventories over 2,177 distinct glottocodes; families from the reference catalogue's language table[108] at SHA-256 1a50a393bc81568b. Rows per inventory: consonant segments, vowel segments, tonemes. Median consonant inventory 22, mean 23.9; median vowel inventory 9, mean 10.3; tonal inventories 636, 21.1 per cent. FL-CHK.1, all inventories: LOCK, $\lambda = 0.959496114180$, det(R) = 0.920632793127, identity residual 4.330×10^{-15}, four-estimator spread 1.110×10^{-16}, $\kappa(R) = 1.6531$, collapse margin 10.14 orders, conditioning margin 5.58; correlations +0.177, +0.159, +0.182. FL-CHK.2, reflection of the tone row on a fixed basis: λ ratio −1.000000, |Δdet(R)| = 0. FL-CHK. 3, one thousand bootstrap resamples, agreement 1.000. FL-CHK.4, one inventory per glottocode, 2,177 languages: LOCK, det(R) = 0.910668, $\kappa = 1.7110$. FL-CHK.5, the corners: /i/ in 92.0 per cent of inventories, /u/ 87.6, /a/ 86.1 with /ɑ/ in a further 7.5; all three of /i u a/ in 76.0, and /i u/ with /a/ or /ɑ/ in 81.1. Consonant core: /m/ 97 per cent, /k/ 90, /j/ 90, /p/ 86, /w/ 82, /n/ 78, /t/ 68, /l/ 68, /s/ 67, /ŋ/ 63, /b/ 63, /g/ 57, /h/ 56, /d/ 46, /ʔ/ 37. FL-CHK.6, the place lattice: at least one labial, one coronal, and one dorsal consonant in 100.0 per cent of inventories each; at least one laryngeal in 68.1. FL-CHK.7, the descent projection: 2,865 inventories carrying a family assignment, in 138 families with at least two members, unmapped glottocodes excluded, family means removed: LOCK, $\lambda = 0.996644155895$, det(R) = 0.993299573480, identity residual 9.992×10^{-16}, spread 7.772×10^{-16}, $\kappa = 1.1776$, within-family correlations +0.035, +0.011, +0.074, bootstrap agreement 1.000. Family means alone, 138 rows: LOCK, det(R) = 0.677939, correlations +0.369, +0.283, +0.446. Within the largest families: Atlantic-Congo, 503 inventories, 0.9747; Indo-European, 277, 0.9986; Sino-Tibetan, 152, 0.8886; Afroasiatic, 147, 0.9202; Austronesian, 141, 0.9581; Pama-Nyungan, 325, refused, the tone row constant. Receipt digests 67bcc503c77dd08c and e8bf4618e040731c. Warrant: E1 throughout, machine-derived this session from two public databases whose own annotations are the source of every count; the locks certify the independence of the generators and license nothing about meaning; reproducible from the files at the digests.

Appendix B · Author's provenance and method disclosure

This paper was developed under Trisduction, a verification and organizing discipline that adds the cited results no warrant; the method and its executable batteries are stated in full at the reference below[61].

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